List of NGSS/STEM Kits by Grade Level

Lending Library: STEM & NGSS Kit - Descriptions and Standards Alignment

Grade	Kit Name	Description & Standards
K	Digging For Worms (NGSS Kit) Resource Drive	**Students explore how animals change the environment to meet their needs.** K-LS1-1: *Use observations to describe patterns of what plants and animals (including humans) need to survive.* K-ESS2-2: *Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs*
K	Sunny Sandbox (Hand2Mind Kit) Engineering Resource Drive	**Students explore the warming effects of the sun and learn about the engineering design process as they help design and build a covering to block the sun.** K-PS3-1: *Make observations to determine the effect of sunlight on Earth's surface.* K-PS3-2: *Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area*.
K	Sidewalk Safety (Hand2Mind Kit) Engineering Resource Drive	**Students explore slopes and speed as they help study a real-world example to design safe ways to slow a bicycle** . K-PS2-1: *Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.* K-PS2-2: *Analyze data to determine if a design solution works as intended to change the speed or direction of an object with a push or a pull.* K.CC.B. 5: *Count to answer "how many?" questions about as many as 20 things arranged in a line, a rectangular array; or a circle, or as 10 things in a scattered confirmation; given a number from 1-20, count out that many objects* K.MD.A. 1: *Describe measurable attributes of objects, such as length or weight. Describe several measurable attributes of a single object.* K.MD.A. 2: *Directly compare two objects with a measurable attribute in common, to see which object has "more"*

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1	Secret of Sound (NGSS Kit) Engineering Resource Drive	**Students explore how vibrating materials make sounds and how sounds make things vibrate. Students build a device that uses light or sound to solve the problem of communicating over a distance**. 1-PS4-1: *Plan and conduct investigations to provide evidence that vibrating materials can make sound and that sound can make materials vibrate.* 1-PS4-4: *Use tools and materials to design and build a device that uses light or sound to solve the problem of communicating over a distance.* K-2-ETS1-2: *Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.*
1	Shadow Box Theater (Hand2Mind Kit) Engineering Resource Drive	**Students explore materials and shadows to help create the scenery of a shadow box theater.** 1-PS4-2: *Make observations to construct an evidence based account that objects in darkness can be seen only when illuminated*. 1-PS4-3: *Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.*
1	Helicopter Hang Time (Hand2Mind Kit) Resource Drive	**Students learn about fair tests to evaluate the strengths and weaknesses of different helicopter designs to build a helicopter land safely.** K-2-ETS1-2: *Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.* K-2 ETS1-3: *Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.* 1-LS1-1: *Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs*
1	Project Park Design (Hand2Mind Kit) Engineering Resource Drive	**Students explore patterns of the Earth and the Sun to determine when and where shadows cover the park. Then, they design a park plan with warm, sunny benches.** Builds on: K-PS3-1: *Make observations to determine the effect of sunlight on the Earth's surface.* 1-ESS1-1: *Use observations of the sun, moon and stars to describe patterns that can be predicted*.

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2	Beach Erosion (NGSS Kit) Engineering Resource Drive	**Students investigate erosion and properties of materials to create a structure that will slow down the rate of beach erosion.** 2-PS1-2: *Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* 2-ESS2-1: *Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.*
2	Ice Ice Baby (NGSS Kit) Resource Drive	**Students investigate properties of various household materials to identify the material of two black plates.** 2-PS1-1: *Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.* 2-PS1-2: *Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.*
2	Muddy Mats (Hand2Mind Kit) Engineering Resource Drive	**Students explore properties of different materials to make a mat that soaks up water.** 2-PS1-2: *Analyze data obtained from testing different materials to determine which materials have properties that are best suited for an intended purpose.*
2	Seed Rescue (Hand2Mind Kit) Engineering Resource Drive	**Students develop a way to pollinate the plants in a greenhouse by creating a model plant pollinator.** 2-PS1-1: *Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.* 2-PS1-2: *Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* 2-LS2-2: *Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.*

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3	Cup Fish Traits (NGSS Kit) Resource Drive	**Students explore how traits are passed down from parents to offspring to argue how variations of characteristics may be more advantageous than others.** 3-LS3-1: *Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in groups of similar organisms.* 3-LS4-2: *Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.*
3	Wildlife Corridors (Hand2Mind Kit) Engineering Resource Drive	**Students study animal needs, habitats, and range. Then they plan, build, and test a model of a wildlife corridor that will help animals cross a busy road safely.** 3-LS4-4: *Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change*.
3	Farmer Grady's Challenge (Hand2Mind Kit) Engineering Resource Drive	**Students learn about weather-related hazards and design a system to protect Farmer Grady's crops from a hailstorm.** 3-ESS3-1: *Make a claim about the merit of a design solution that reduces the impact of a weather-related hazard*
3	Helping Hand Design (Hand2Mind Kit) Engineering Resource Drive	**Students learn about animal adaptations and then use their findings to plan, build, and test an assistive technology tool for people who cannot bend over to pick up objects.** 3-LS4-2: *Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.* 3-LS4-3: *Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.*
3	Mighty Seltzer Rocket (Grade 3) (STEM Kit) Resource Drive	**Students investigate how temperature of water and amount of alka seltzer influence the reaction rate of alka seltzer and water. Students develop a rocket fuel mixture based on evidence from investigations.** 3-PS2-2: *Make observations and/or measurements of an object's motion to provide evidence that a pattern can be used to predict future motion.* CCSS Math 3.MD.4 - *Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.*

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4	Flooding (NGSS Kit) Engineering Resource Drive	**Students explore the effects of different types of flooding to develop a design that prevents flood damage.** 4-PS3-1: *Use evidence to construct an explanation relating the speed of an object to the energy of that object.* 4-ESS3-1: *Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.* 3-5 ETS1-1: *Define a simple design problem reflecting a need or a want that includes a specified criteria for success and constraints on materials, time, or cost.*
4	Digital Relay (Hand2Mind Kit) Engineering Resource Drive	**Students learn how to use codes to protect information and then they design, build, and test a code transmission system.** 4-PS4-3:*Generate and compare multiple solutions that use patterns to transfer information.* 4-ESS2-2*: Analyze and interpret data from maps to describe patterns of Earth's features.*
4	Coding & Mineral Collection Challenge (Hand2Mind Kit) Engineering Resource Drive	**Students explore the effects of erosion, weathering, and landslides on the Earth's surface. Their challenge is to code a robot to collect minerals that have surfaces in areas unsafe for humans to go.** 4-ESS1-1: *Identify evidence from patterns in rock formation and fossil in rock layers to support an explanation for changes in a landscape over time* 4-ESS2-1: *Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind and vegetation.* 5-PS1-3: *Make observations and measurements to identify materials based on their properties.*
4	Mighty Seltzer Rocket (Grade 4) (STEM Kit) Resource Drive	**Students investigate how the amount of alka seltzer & temperature of water influence the reaction time of alka seltzer & water. Students develop a rocket fuel mixture based on evidence from investigations.** 4-PS3-1 - *Use evidence to construct an explanation relating the speed of an object to the energy of that object.* CCSS Math 4.MD.1 - *Know relative sizes of measurement units within one system of units including hr, min, sec.*

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5	Rockets and Reactions (NGSS Kit) Engineering Resource Drive	**Students investigate open and closed systems and how certain factors influence the reaction rate of alka seltzer and water. Students develop a rocket fuel mixture based on evidence from investigations and create a model to describe what caused the rocket to launch.** 5-PS1-1: *Develop a model to describe that matter is made of particles too small to be seen.* 5-PS1-2: *Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.*
5	Rainwater Runoff (Hand2Mind Kit) Engineering Resource Drive	**Students investigate sources and types of water pollution. Then they design, build, and test a model of subsoil that filters water through a rain garden.** 5-PS1-3: *Make observations and measurements to identify materials based on their properties.* 5-ESS2-1: *Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.* 5-ESS2-2: *Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth.* 5-ESS3-1: *Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment*
5	The Great Toy Design (Hand2Mind Kit) Resource Drive	**Students identify materials based on their properties, evaluate competitor's toys, and design a superior toy to sell.** 5-PS1-2: *Measure and graph quantities to provide evidence that regardless of the type of change that occurs when heating, cooling, or mixing substances, the total weight of matter is conserved.* 5-PS1-3: *Make observations and measurements to identify materials based on their properties*

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6	Coral Conservation (NGSS Kit) Engineering Resource Drive	**Students learn about what coral need to survive and how changes in global temperatures affect them. Students develop a system that allows coral to grow and propagate.** MS-PS3-3: *Apply scientific principles to design, construct and test a device that either minimizes or maximizes thermal energy transfer.* MS-LS1-5: *Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.* MS-ESS3-5: *Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.* MS-ETS1-3: *Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.*
6	Energy Investigations (NGSS/STEM Kit) Resource Drive	**Students investigate different forms of energy and observe how the energy is transferred all around us in our daily lives. Students create an argument to justify whether a car collision is a weak or strong transfer of energy.** MS-PS3-5: *Construct, use and present arguments to support the claim that when kinetic energy of an object changes, energy is transferred to or from the object.* CCSS Math 6.SP.2 - *Understand that a set of data collected to answer a statistical question has a distribution which can be described by its spread.* CCSS Math 6.RP.3 - *Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.*
6	Mighty Seltzer Rocket (Grade 6) (STEM Kit) Resource Drive	**Students investigate how the amount of alka seltzer and temperature of water influence the amount of energy transferred in an alka seltzer and water reaction. Students develop a rocket fuel mixture based on evidence from investigations.** MS-PS3-4: *Plan an investigation to determine the relationships among the energy transferred, the change in the average kinetic energy of the particles as measured by the temperature of the sample.* MS - PS3-5: *Construct, use and present arguments to support the claim that when the kinetic energy of the object changes, energy is transferred to or from the object* CCSS Math 6.RP.3 - *Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.*

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7	Save our Seas (NGSS Kit) Resource Drive	**Students explore how the consistent increase in Carbon Dioxide in the atmosphere affects our oceans through a series of investigations.** MS-PS1-2: *Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.* MS-LS2-4: *Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.*

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8	Magnets and Gravity (NGSS Kit) Resource Drive	**Students discover how invisible magnetic forces exist between magnets and are affected by multiple factors. Students use their understanding of magnets to explore a similarly acting invisible force, gravity, which plays a role in the motions within our solar system and surrounding galaxies** MS-PS2-4: *Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects.* MS-PS2-5: *Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.* MS-ESS1-2: *Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.*